

FLORA OF PANAMA¹

Part VI

FAMILY 104. HIPPOCRATEACEAE²

BY CALAWAY H. DODSON³ AND ANDRÉ ROBYNS^{3, 4}

Lianas, shrubs or sometimes trees; milky latex present or not. *Leaves* usually opposite, occasionally subopposite or alternate, simple, petiolate, generally stipulate, the stipules interpetiolar, small, caducous, sometimes absent. *Inflorescences* axillary or terminal, sometimes extra-axillary, thyrsoïd, cymose, racemose, paniculate or fasciculate, sometimes flowers solitary. *Flowers* bracteolate, usually small, hermaphrodite, infrequently unisexual, antinomorphic; calyx usually almost divided to the base, the lobes generally 5, infrequently 2-4, imbricate, equal or not, usually persistent; petals mostly 5 (3-4), imbricate or valvate, entire to serrate at the margins; disc generally present, various, often conspicuous, usually continuous, rarely discontinuous; stamens usually 3, inserted usually within the disc, the filaments free or often connate basally; anthers basifixed, 2-thecate, the thecae distinct or more or less confluent, extrorse or introrse, dehiscing transversely or longitudinally; pollen grains simple or in tetrads; ovary superior, often concealed within the disc and sometimes adnate to it, (2-) 3-celled, the placentation axile, the ovules 2-many in each cell, usually collateral or 2-seriate, anatropous; style 1, usually short, rarely none, the stigmas obscure or obvious, usually 3, entire or bifid. *Fruits* of 3 capsular mericarps, these attached separately to the receptacle or connate proximally, dehiscing along a median, longitudinal suture and 2-valvate, or drupaceous or baccate; seeds few to numerous, with a more or less developed, basal wing or wingless and imbedded in mucilaginous pulp, exalbuminous; cotyledons free or united.

A family of 18 genera, chiefly distributed in the tropics of both hemispheres. The 12 genera recognized by A. C. Smith in his comprehensive work on the American *Hippocrateaceae* (Brittonia **3**: 341-555, 12 figs. 1940) occur in Panama.

The *Hippocrateaceae* are very closely related to the *Celastraceae* and are often treated as a part of the latter.

¹ The Flora of Panama by Robert E. Woodson, Jr. and Robert W. Schery and Collaborators should be cited as: Ann. Missouri Bot. Gard., with volume number, pagination and date of the Annals.

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³ The co-authors have adapted this article from "The American Species of *Hippocrateaceae*" by A. C. Smith, Brittonia **3**: 341-555. 1940.

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ANN. MISSOURI BOT. GARD. **52**: 81-98, No. 1. 1965.

- a. Fruit drupaceous; seeds wingless, embedded in mucilaginous pulp.
 - b. Disc discontinuous, composed of 3 saccate, staminiferous lips; anthers dehiscing transversely; style 01. CHEILOCLINIUM
- bb. Disc continuous; style present.
 - c. Disc short-cylindric, membranous or thin-carnose.
 - d. Flowers 4.5-5 mm. in diam.; anthers dehiscing by transversal, confluent clefts; fruit up to 11 cm. in diam.2. TONTELEA
 - dd. Flowers 1.7-2.2 mm. in diam.; anthers dehiscing by longitudinal clefts, the connective obvious; fruit up to 3 cm. long and about 1 cm. in diam.3. PERITASSA
- cc. Disc annular-pulvinate, carnose4. SALACIA
- aa. Fruit composed of 3 capsular mericarps; seeds with a more or less developed, basal wing; disc continuous; anthers dehiscing transversely.
 - e. Mericarps connate proximally; flowers (5.5-)7-11 mm. in diam.
 - f. Petals serrate at the margins; disc short-cylindric, carnose; ovules 8-14 per cell, imbricate in a mass; flowers 10-11 mm. in diam.5. ANTHODON
 - ff. Petals entire and often revolute at the margins; disc annular-pulvinate, thick-carnose; ovules 6-8 per cell, 2-seriate; flowers (5.5-)7-10 mm. in diam.6. HEMIANGIUM
- ee. Mericarps attached separately to the receptacle.
 - g. Disc short-cylindric, membranous to carnose.
 - h. Flowers 1.5-2.7 mm. in diam.
 - i. Sepals as long as broad, acute or subacute; pericarp woody; flowers 1.5-2 mm. in diam.7. HYLENAEA
 - ii. Sepals broader than long, rounded; pericarp thin-coriaceous; flowers 2-2.7 mm. in diam.8. ELACHYPTERA
 - hh. Flowers 10-17 mm. in diam.; sepals broader than long, rounded; pericarp thin-coriaceous9. CUERVEA
 - gg. Disc annular-pulvinate, conspicuously carnose.
 - j. Leaf-blades scabrous; disc conspicuously flattened and puberulus; flowers 9-12 mm. in diam.10. PRIONOSTEMMA
 - jj. Leaf-blades not scabrous; disc not both flattened and puberulus; flowers 1.7-8 mm. in diam.
 - k. Flowers 1.7-3.5 mm. in diam.; petals glabrous; disc minute, forming an annular cushion below the stamens, glabrous11. PRISTIMERA
 - kk. Flowers 4-8 mm. in diam.; petals barbellate within; disc conspicuous, cupuliform, minutely tomentellous-papillate without12. HIPPOCRATEA

1. CHEILOCLINIUM Miers*

CHEILOCLINIUM Miers, Trans. Linn. Soc. London **28**: 420. 1872.

Lianas or slender shrubs or trees usually with the upper branches scandent, glabrous throughout or essentially so, the branches and branchlets opposite; milky latex present. *Leaves* opposite, petiolate. *Inflorescences* axillary, pedunculate, thyrsoïd, corymbose or cymose. *Flowers* hermaphrodite, small, pedicellate; sepals 5, narrowly imbricate, semiorbicular to deltoid or ovate, often erosulous or fimbriolate at the margins; petals 5, narrowly imbricate, usually rounded at the apex and entire, often thinly carnose; disc discontinuous, composed of 3 saccate, carnose, staminiferous lips confluent with the base of the ovary; stamens 3, the filaments often slightly enlarged at the apex, the anthers small, extrorsely nutant, transversely ellipsoid, dehiscing by transversal, confluent, extrorse clefts; ovary 3-lobed,

* The reader may refer to Smith (Brittonia **3**: 341-555. 1940) for complete generic and specific synonymy.—Editor.

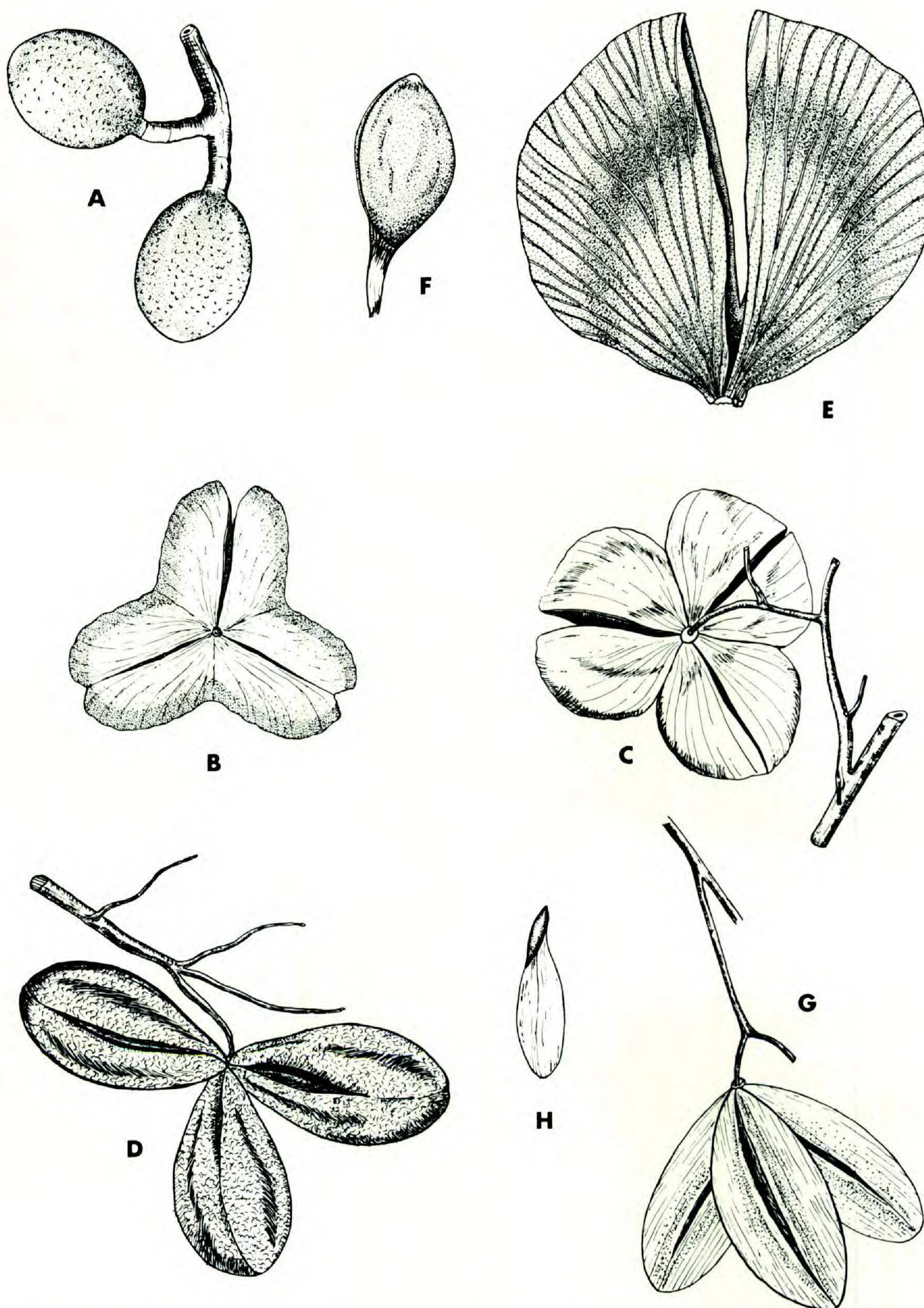


Figure 1. *CHEILOCLINIUM COGNATUM* (Miers) A. C. Smith: A, fruit ($\times \frac{1}{2}$), after Krukoff 10349 (Bolivia) (MO). *ANTHODON PANAMENSE* A. C. Smith: B, fruit ($\times \frac{1}{4}$), after Dodge 16755. *HEMIANGIUM EXCELSUM* (H. B. K.) A. C. Smith: C, fruit ($\times \frac{1}{2}$), after Matuda 4788 (Mexico) (MO). *HYLENAEA PRAECLSA* (Miers) A. C. Smith: D, fruit ($\times \frac{1}{4}$), after Stern, Chambers, Dwyer & Ebinger 942. *CUERVEIA KAPPLERIANA* (Miq.) A. C. Smith: E, mericarp ($\times \frac{1}{2}$), F, seed ($\times \frac{1}{2}$), after Stern, Chambers, Dwyer & Ebinger 965. *HIPPOCRATEA VOLUBILIS* L.: G, fruit ($\times \frac{1}{2}$), H, seed ($\times \frac{1}{2}$), after Dodge, Steyermark & Allen 16825.

flattened at the truncate apex, 3-celled, the cells 2- or 4-ovulate, the ovules usually attached to the upper portion of the interior angles, collateral or superposed or in superposed pairs; stigmas 3, sessile, radiating, entire or emarginate or bilobed, opposite the stamens and alternating with the cells of the ovary. *Fruits* drupaceous, small or medium-sized, subglobose, the pericarp coriaceous, the dissepiments soon evanescent; seeds 2-6, embedded in mucilaginous pulp, angulate, wingless.

A neotropical genus of 20 species, of which only one has been encountered in Panama.

1. *CHEILOCLINIUM COGNATUM* (Miers) A. C. Smith, *Brittonia* **3**: 529. 1940.—Fig. 1(A).

Kippistia cognata Miers, *Trans. Linn. Soc. London* **28**: 417. 1872.

Shrub or slender tree up to 12 m. high, the branches often scandent. *Leaves* with the blade oblong or elliptic-oblong or ovate-oblong, obtuse or subacute at the base, acuminate at the apex, narrowly revolute and subentire or crenate at the margins, 8-20 cm. long and 2.5-8 cm. broad, chartaceous, the costa prominent on both sides. *Inflorescences* short-pedunculate, thyrsoïd, 2-10 cm. long. *Flowers* congested in ultimate dichotomies or paired at the end of ultimate branchlets, the pedicel stout, very short and usually less than 1 mm. long; sepals broadly deltoid-ovate or semiorbicular, obtuse at the apex, entire or faintly erosulous at the margins, 0.7-1.3 mm. long; petals 5, suberect, oblong or obovate-oblong, rounded at the apex, entire at the margins, 1.5-2.6 mm. long, subcarnose or subcoriaceous, opaque or obscurely lineolate; lips of the disc 0.3-0.4 mm. high; filaments of the stamens ligulate, 0.4-0.7 mm. long, the anthers about 0.2 mm. long and 0.3 mm. broad; ovary 1-1.3 mm. in diam., the ovules 2 per cell and collateral, the stigmas linear and obtuse. *Fruits* spherical or oblong-ellipsoid, up to 3.5 cm. long and 3 cm. broad, the pericarp 1-2 mm. thick, obscurely rugulose, often lenticellate; seeds few, 4-6, often superposed in pairs, ovate, up to 15 mm. long.

Panama to Amazonian Peru and Bolivia and to Rio de Janeiro; West Indies (Tobago).

CANAL ZONE: below Gatun, banks of the Chagres River, *Maxon 4796!* (F, US). DARIEN: Marraganti, *R. S. Williams 1005!* (NY, US). PANAMA: Cerro Azul, *Dwyer 1395!* (US).

In *Dwyer 1935*, the leaves and the fruits, although immature, are smaller than in the typical *C. cognatum*.

2. TONTELEA Aubl.

TONTELEA Aubl., *Hist. Pl. Gui. Fr.* 31. 1775.

Lianas or slender shrubs or trees with the upper branches scandent, glabrous throughout or essentially so; milky latex often present. *Leaves* opposite or subopposite, rarely alternate, petiolate, the petiole canaliculate. *Inflorescences* axillary or arising from defoliate branchlets, pedunculate or not, thyrsoïd-paniculate or

pseudodichotomously branching. *Flowers* hermaphrodite, small, sessile or short-pedicellate, arranged in loose clusters of 2-5 near or at the apex of ultimate branchlets; sepals 5, narrowly imbricate, broader than long, obtuse or rounded at the apex, entire to fimbriate at the margins; petals 5, narrowly imbricate, usually rounded at the apex, entire to erosulous at the margins, submembranous to thin-carnose; disc continuous, short-cylindric, free or sometimes adnate to the ovary by inconspicuous, interstaminal septa, entire or undulate or crenulate at the margin, membranous to thin-carnose; stamens 3, rarely 4, erect to subspreading, the filaments ligulate, the anthers usually extrorsely nutant, broader than long, the thecae usually subglobose and laterally confluent, dehiscing by transversal, confluent, extrorse clefts; ovary depressed-conical or 3-gonous, the angles usually rounded, 3-celled, each cell usually 2-ovulate, the ovules collateral or superposed; style short, terete, carnose, the stigmas 3, obvious and divaricate, alternate with or opposite to the stamens and the cells of the ovary, entire or 2-lobed, sometimes obscure. *Fruits* drupaceous, often large, the pericarp coriaceous or woody, the dissepiments persistent or evanescent; seeds usually few, embedded in mucilaginous pulp, angulate, wingless.

A neotropical genus of 31 species, one of which occurs in Panama.

1. TONTELEA RICHARDII (Peyritsch) A. C. Smith, Brittonia **3**: 478. 1940.

Salacia Richardi Peyritsch in Mart., Fl. Bras. **11**(1): 148. 1878.

Liana, the branches stout, subterete. *Leaves* opposite, the petioles stout, 12-17 mm. long, the blade elliptic to oblong, rounded or obtuse and decurrent at the base, cuspidate or short-acuminate at the apex, entire and slightly recurved at the margins, 9-20 cm. long and 4-10 cm. broad, coriaceous or thin-coriaceous, the costa stout and prominent on both surfaces. *Inflorescences* axillary, thyrsoide-paniculate or pseudocymose, 3-4.5 cm. long. *Flowers* 4.5-5 mm. in diam.; sepals semiorbicular, rounded at the apex, entire, 0.7-1.3 mm. long and 1-1.5 mm. broad, papyraceous; petals elliptic- or subspatulate-obovate, 1.7-2.5 mm. long and 1.3-2.2 mm. broad, thin-carnose; disc erect, subentire or undulate at the margin, 0.3 mm. high, submembranous; stamens erect, the filaments 0.4-0.6 mm. long, slightly expanded toward the base, the anthers 0.3-0.5 mm. long and 0.6-0.9 mm. broad; ovary trigonous-conical, the style 2 per cell, superposed; style 0.2-0.4 mm. long, the stigmas spreading, deltoid, alternate with the stamens. *Fruits* often paired, subglobose or somewhat obovoid, slightly contracted at the base, rounded at the apex, up to 11 cm. in diam., the pericarp woody, finely rugulose without, the dissepiments persistent and coriaceous; seeds few, oblong-ovoid, 3-4 cm. long.

Panama and the Guianas; a colloquial name in Panama is *bejuco de canjura*.

CANAL ZONE: Barro Colorado Island, Aviles 54! (F), Shattuck 658! (F, MO), Wetmore, Abbe & Shattuck 92! (F), Zetek 3823! (F).

3. PERITASSA Miers

PERITASSA Miers, Trans. Linn. Soc. London **28**: 402. 1872.

Lianas, shrubs or slender trees with the upper branches scandent, glabrous throughout or nearly so. *Leaves* opposite, subopposite or alternate, petiolate, the petiole canaliculate. *Inflorescences* axillary or arising from defoliate branchlets, pedunculate, thyrsoïd-paniculate, corymbose or cymose. *Flowers* hermaphrodite, small, subsessile or shortly pedicellate, congested or loosely arranged toward the apex of ultimate branchlets; sepals 5, narrowly imbricate, suborbicular to deltoid, erosulous or fimbriolate at the margins; petals 5, narrowly imbricate, rounded at the apex, usually erosulous at the margins, thin-carnose or submembranous; disc continuous, erect or suberect, short-cylindric, free, often crenulate at the margin, membranous to thin-carnose; stamens 3, usually erect, the filaments ligulate, the anthers extrorse, the thecae vertical or oblique, dorsally adnate to a thickened connective and laterally contiguous, dehiscing by longitudinal clefts, the connective sometimes produced into an apiculum; ovary usually depressed-subglobose, 3-celled, each cell 2- or 4-ovulate, the ovules collateral or somewhat superposed, attached to the interior angles near the center, sometimes one erect and the other suspended; style short, tapering, truncate, the stigmas obscure. *Fruits* drupaceous, small or medium-sized, the pericarp chartaceous to woody, the dissepiments soon evanescent; seeds 2-6, imbedded in mucilaginous pulp, angulate, wingless.

A neotropical genus of 14 species, one of which occurs in Panama.

1. PERITASSA PRUINOSA (Seem.) A. C. Smith, Brittonia **3**: 520. 1940.

Salacia pruinosa Seem., Bot. Voy. Herald 90. 1853; Hemsl. (sub *Hippocratea* sp. 10), Biol. Centr.-Am. **1**: 194. 1880.

Sicyomorpha pruinosa Miers, Trans. Linn. Soc. London **28**: 411. 1872.

Liana or shrub with scandent branches, the branchlets slender, cinereous, copiously lenticellate. *Leaves* opposite or subopposite, the petiole stout, 6-12 mm. long, rugose; blade elliptic or obovate-oblong, obtuse at the base, obtusely short-cuspidate at the apex, entire or obsoletely crenulate at the margins, 10-20 cm. long and 3.5-9.5 cm. broad, thin-coriaceous, the costa prominent on both surfaces. *Inflorescences* compactly dichotomously several times branched, 1-2.5 cm. long, the peduncle short. *Flowers* usually paired or ternate, 1.7-2.2 mm. in diam., the pedicel slender and about 1 mm. long; sepals ovate-deltoid, rounded at the apex, erosulous to densely ciliate at the margins, 0.4-0.6 mm. long and slightly broader, papyraceous; petals oblong, erosulous or minutely ciliolate distally, 1-1.3 mm. long and 0.7 mm. broad, papyraceous or thin-carnose; disc subentire at the margin, about 0.2 m. high, thin-carnose or submembranous; filaments of the stamens about 0.6 mm. long, the thecae distinct, slightly divergent at the base, about 0.2 mm. long, dehiscing by longitudinal, oblique clefts, the connective deltoid; ovary about 0.5

mm. in diam., the ovules 2 per cell, the style about 0.3 mm. long, the stigmas obscure or minutely capitate. *Fruits* 1 per inflorescence, subcylindric-ellipsoid, sometimes falcate, up to 3 cm. long and about 1 cm. in diam., the pericarp woody, at least 2 mm. thick; seeds 1-2.

Panama and northern Colombia.

PANAMA: Hacienda de Tapia, Seemann 1219 (K, type; photo F, US); near Panama, Hayes 652 (K).

4. SALACIA L.

SALACIA L., Mant. Pl. 159. 1771.

Lianas, scandent or sometimes erect shrubs, rarely slender trees with the upper branches scandent, glabrous throughout or essentially so, the branchlets usually terete, the bark smooth or lenticellate; milky latex sometimes present. *Leaves* opposite or alternate, the petiole canaliculate, stipulate or not, the stipules small and soon deciduous. *Inflorescences* axillary or on defoliate branchlets, cymose, paniculate, racemose or fasciculate. *Flowers* hermaphrodite, rarely unisexual by abortion, often relatively large for the family, pedicellate, congested or loosely arranged; calyx usually deeply 5-lobed, the lobes unequal, frequently scarious and erosulous at the margins; petals usually 5, imbricate, sessile or sometimes subunguiculate, entire or erosulous at the margins; disc continuous, annular-pulvinate, truncate-conical or flattened, carnose; stamens usually 3, suberect to reflexed, the filaments ligulate, usually broadened toward the base, the anthers dehiscing by a transversal, apical or extrorse cleft, or by 2 longitudinal or oblique and mostly apically confluent clefts; pollen grains simple; ovary usually immersed in the disc, conical, cylindric or 3-lobed, (2-)3-celled, the cells 2- to many-ovulate, the ovules collateral, superposed or in superposed pairs; ovary gradually narrowed into a distinct or obscure style, the stigmas obscure. *Fruits* drupaceous, subglobose or ellipsoid, the pericarp coriaceous, 1- to 3-celled, the dissepiments evanescent or not; seeds 1-many, embedded in mucilaginous pulp, wingless; cotyledons massive, free or united.

A pantropical genus of about 200 species. A. C. Smith (Brittonia **3**: 423-463. 1940) lists 29 species from the Western Hemisphere; only one imperfectly known species occurs in Panama.

1. SALACIA MEGISTOPHYLLA Standley, Field Mus. Nat. Hist., Bot. Ser. **4**: 222. 1929; A. C. Smith, Brittonia **3**: 439. 1940.

Liana, the branchlets stout, lenticellate. *Leaves* opposite, the petiole stout, 1.8-2 cm. long, strongly rugose; blade ovate-oblong, rounded at the base, obtusely and gradually short-acuminate at the apex, entire and narrowly revolute at the margins, the costa sharply elevated above, prominent beneath, 34-37 cm. long and 13-14 cm. wide, thick-coriaceous, rugose on both surfaces. *Flowers* unknown. *Fruits* more or less globose, up to 5-6 cm. in diam., the pericarp coriaceous, 2-3 mm. thick, minutely rugulose, the fruiting pedicel woody, 6-9 mm. in diam.; seeds apparently 2-4, probably about 3 cm. long.

Panama and Venezuela.

BOCAS DEL TORO: Region of Almirante, Cricamola, Cooper 503! (F, type).

An additional collection, *Ch. & W. von Hagen 2133!* (MO, NY) (Chiriquí, Boquete region, Cerro Horqueta), can possibly be referred to this species. Indeed, the shape, texture and venation of the leaves, and the fruits strongly suggest *S. megistophylla*, but both the leaves and the fruits are too small.

5. ANTHODON Ruiz & Pavon

ANTHODON Ruiz & Pavon, Fl. Peruv. Chil. **1**: 45. 1798.

Lianas, the branches stout, terete, cinereous, the branchlets usually opposite, elongate, slender. *Leaves* opposite or subopposite, petiolate. *Inflorescences* axillary, pedunculate, cymose, dichotomously branched. *Flowers* hermaphrodite, paired or ternate at the apex of ultimate inflorescence-branchlets or solitary in distal dichotomies, pedicellate; sepals 5, erosulous or ciliolate at the margins; petals 5, imbricate, spreading, serrate at the margins; disc continuous, suberect, short-cylindric, usually flattened or grooved on the margin, carnose; stamens 3, suberect, the filaments ligulate, the anthers broadly reniform, dehiscing by apical, transversal, confluent clefts; ovary depressed-3-lobed, 3-celled, the cells 8- to 14-ovulate, the ovules imbricate in a mass attached to the inner basal angle; style stout, carnose, the stigmas 3, minute, often obscure, opposite the stamens. *Fruits* of 3 flattened, capsular mericarps, these spreading, firmly connate proximally, convex on both surfaces, sharp and entire at the margin, inconspicuously carinate and dehiscing along a median suture, the pericarp coriaceous, flabellate-costate without, smooth within; seeds 8-14 per mericarp, closely imbricate, affixed by a basal, membranous wing.

A neotropical genus of two species, one from Panama.

1. ANTHODON PANAMENSE A. C. Smith, Brittonia **3**: 422, fig. 8 (*a-f*). 1940.—Fig. 1(B).

Hippocratea malpighiaefolia sensu Standley, Contr. Arnold Arb. **5**: 93. 1933, pro parte quoad Woodworth & Vestal 715, non Rudge (1805).

Liana, glabrous throughout, the branchlets subterete or faintly quadrangular, cinereous or brownish. *Leaves* with the petiole 5-8 mm. long, the blade elliptic or elliptic-oblong, obtuse at the base, obtuse or obtusely short-cuspidate at the apex, undulate or crenulate at the margins, 8-11 cm. long and 3-5.5 cm. broad, papyraceous, the costa elevated or nearly plane above, prominent beneath. *Inflorescences* 2.5-5 cm. long. *Flowers* 10-11 mm. in diam., the bracteoles ovate; sepals semiorbicular, rounded at the apex, erosulous at the margins, 1.3-1.5 mm. long and 2.2 mm. broad, papyraceous; petals elliptic-oblong or ovate-lanceolate, rounded at the apex, conspicuously serrate at the margins, 5-5.5 mm. long and 2.5-3 mm. broad, carnose; disc entire at the margin and flattened or rounded at the apex, about 0.5 mm. high; filaments of the stamens slightly broadened toward the base, 0.8-1 mm. long, the anthers about 0.6 mm. long and 1-1.2 mm. broad; ovary about 1 mm. in diam., the style about 0.5 mm. long. *Fruits* up to 15 cm. in diam., the mericarps connate for 3-5 cm., broadly oblong-deltoid, often conspicuously emarginate at the apex,

the pericarp about 0.2 mm. thick distally and 0.5 mm. thick toward the base; seeds 10-14 per mericarp.

Native to Panama; a local name is *bejuco de estrella*.

CANAL ZONE: Barro Colorado Island, *Aviles* 56! (F), 922! (F), *L. H. & Ethel Zoe Bailey* 485! (F), *Shattuck* 922! (MO), *Woodworth & Vestal* 715! (F). COLÓN: along trail to triangulation station on top of Tumba Vieja, 90-400 m., *Dodge* 16755! (MO); along Río Sirrí, Trinidad Bassin, 20-50 m., *Pittier* 4018! (F, type).

6. HEMIANGIUM A. C. Smith

HEMIANGIUM A. C. Smith, *Brittonia* **3**: 411. 1940.

Lianas or erect, woody plants, the branches stout, terete, glabrous, the branchlets opposite, sparsely lenticellate. *Leaves* generally opposite, petiolate. *Inflorescences* axillary or rarely crowded in groups of 4-6 at the apex of short, leafless branchlets, pedunculate, paniculate or pseudocymose. *Flowers* hermaphrodite, rather large for the family, pedicellate, loosely arranged, usually solitary at the apex of ultimate branchlets; sepals 5; petals 5, suberect or spreading, glabrous; disc continuous, annular-pulvinate, conspicuous, slightly narrowed and entire at the margin, thick-carnose, glabrous; stamens 3, suberect or spreading, the filaments ligulate, conspicuously broadened and nearly contiguous at the base, the anthers transversely ellipsoid, the thecae laterally confluent, dehiscing by apical, transversal, confluent clefts; ovary more or less immersed in the disc, depressed-3-lobed, 3-celled, the cells 6- to 8-ovulate, the ovules 2-seriate; style subulate, the stigmas obscure. *Fruits* few per inflorescence, of 3 capsular mericarps, these spreading, connate at the basal margins, slightly convex on both surfaces, emarginate at the apex, bluntly carinate and dehiscing along a median suture, the pericarp coriaceous; seeds 6-8 per mericarp, affixed by a basal wing, the embryoniferous portion coriaceous, the wing membranous.

A monotypic, neotropical genus.

1. HEMIANGIUM EXCELSUM (H. B. K.) A. C. Smith, *Brittonia* **3**: 414, fig. 7. 1940. —Fig. 1(C).

Hippocratea excelsa H. B. K., *Nov. Gen. Sp. Pl.* **5**: 139. 1822; Benth., *Bot. Voy. Sulphur* 78. 1844; Miers, *Trans. Linn. Soc. London* **28**: 340. 1872; Hemsl., *Biol. Centr.-Am.* **1**: 193. 1880.

Liana or shrub or slender tree up to 10 m. high, the young parts often puberulus or tomentellous. *Leaves* with the petiole slender, 5-10 mm. long, canaliculate; blade oblong-elliptic or obovate or narrowly so, narrowly rounded or subattenuate at the base, rounded, obtuse, cuspidate or rarely callose-mucronate at the apex, obsoletely crenulate or crenate-serrate and often narrowly revolute at the margins, 3-14 cm. long and 3-7.5 cm. wide, chartaceous or thin-coriaceous, sometimes persistently tomentellous beneath. *Inflorescences* 1.5-6 cm. long, the peduncle often slightly flattened, 1-2.5 cm. long, the branchlets terete. *Flowers* (5.5-)7-10 mm. in diam., the pedicel about 3-5 mm. long, puberulus or glabrous, the bracteoles

2-3, about 0.5 mm. long; sepals deltoid-ovate or suborbicular, subacute to rounded at the apex, entire or erosulous and often scarious at the margins, 0.9-1.5 mm. long and 0.9-2(2.8) mm. broad, submembranous to thin-carnose, often puberulus without, sometimes glandular-punctate or -lineolate; petals oblong, elliptic-oblong or ovate-elliptic, rounded or obtuse at the apex, entire and often narrowly revolute at the margins, 3-5 mm. long and 2-4 mm. broad, submembranous or thin-carnose, sometimes glandular; disc 0.5-1.3 mm. high; filaments of the stamens 0.8-1.8 mm. long, the anthers 0.3-0.6 mm. long and 0.7-1.1 mm. broad; ovary 1-1.3 mm. in diam., the style 0.5-1.5 mm. long. *Mericarps* connate proximally for 0.8-3 cm., attached to a swollen receptacle, elliptic or broadly obovate, sharp and entire at the margins, 4-6 cm. long and 3.5-6.5 cm. wide, the pericarp inconspicuously flabellate-costate without, smooth within; seeds with the embryoniferous portion ovoid, 7-10 mm. long and 3-7 mm. broad, the wing obovate-elliptic, slightly falcate, up to 3.5 cm. long and 1.5 cm. wide.

From southern Mexico to Colombia and Venezuela, also in southeastern Brazil and Paraguay.

VERAGUAS: locality unknown, *Hinds s. n.* (fide Benth., loc. cit.; Miers, loc. cit.; and Hemsl., loc. cit.).

7. HYLENAEA Miers

HYLENAEA Miers, Trans. Linn. Soc. London **28**: 366. 1872.

Lianas or slender trees with scandent branches, glabrous throughout. *Leaves* opposite or subopposite, petiolate, the petioles shallowly canaliculate. *Inflorescences* axillary, pedunculate, much branched, paniculate-corymbose or pseudocymose, the branchlets slender or not. *Flowers* hermaphrodite, minute, pedicellate; sepals 5, usually longer than broad or as long as broad, acute or subacute, membranous; petals 5, imbricate, faintly erosulous at the margins, membranous; disc continuous, erect, short-cylindric, membranous to thin-carnose; stamens 3, suberect or reflexed, the filaments ligulate, gradually broadened toward the base, the anthers extrorsely nutant, subglobose or transversely oblong, dehiscing by apical, transversal, confluent clefts; ovary depressed-3-lobed, 3-celled, each cell 4- or 6-ovulate the ovules 2-seriate, ascending from the inner basal angle; style carnos, the stigmas obscure. *Fruits* of 3 capsular mericarps, these divergent, separately attached to a greatly swollen receptacle, conspicuously convex on both surfaces, rounded and blunt at the margins, dehiscing along an obscure median suture, the pericarp woody; seeds 4-6 per mericarp, affixed by a comparatively small, basal wing.

A neotropical genus of two species, one native to Panama.

1. HYLENAEA PRAECELSA (Miers) A. C. Smith, Brittonia **3**: 410, fig. 6 (a-n). 1940; Johnston, Sargentia **8**: 188. 1949.—Fig. 1 (D).

Tyloderma praecelsa Miers, Trans. Linn. Soc. London **28**: 414. 1872.

Salacia praecelsa (Miers) Standley, Contr. U. S. Nat. Herb. **27**: 243. 1928.

Liana, the branchlets slender, subterete or distally faintly quadrangular, cinereous or brownish. *Leaves* with the blade elliptic-oblong, rounded or subcordate at

the base, abruptly acuminate or cuspidate at the apex, entire and minutely recurved at the margins, 8-26 cm. long and 3.5-11 cm. broad, chartaceous or thin-coriaceous, lustrous above, the costa prominent on both surfaces. *Inflorescences* 1.5-5 cm. long, the peduncle, rachis and branchlets slender, straight, flattened or quadrangular. *Flowers* 1.5-2 mm. in diam., the pedicel capillaceous, 1.2-1.8 mm. long; sepals oblong-ovate, subacute, obscurely erosulous at the margins, 0.3-0.5 mm. long and broad; petals suberect or spreading, oblong-obovate, rounded at the apex, 1 mm. long and 0.6 mm. broad; disc entire or faintly crenulate at the margin, about 1 mm. high, membranous; stamens suberect, 0.3-0.4 mm. long; ovary 0.3-0.4 mm. in diam., the ovules 4 per cell, the style about 0.2 mm. long. *Mericarps* obovate, rounded or faintly emarginate at the apex, 7.5-10 cm. long, 4-8 cm. broad and 1-2 cm. thick, dehiscing along an obscure median suture and often strongly involute at the sutures at maturity, the pericarp 1.5-2 mm. thick, rugose and conspicuously sparsely furfuraceous without, smooth or flabellate-costate within; seeds 4 or fewer (by abortion) per mericarp, the embryoniferous portion ellipsoid or oblong-cylindric, slightly falcate, 5-6 cm. long and about 1.5 cm. broad, the wing obdeltoid, about 2 cm. long and conspicuously narrowed toward the base.

Native to Panama; one of the local names is *colmillo de puerco*.

CANAL ZONE: near Chagres, *Hayes* 708 (K, type; photo F, US); vicinity of Fort Sherman, wooded swamp, *Standley* 31107! (US); along road south of Fort Sherman, *Johnston* 1580! (MO); along the Chagres River below Gatun, near sea level, *Pittier* 2805! (F, US); region of Chagres River, *Babbitt* 491! (F); forest along the Río Indio de Gatun, near sea level, *Pittier* 2770! (US); Barro Colorado Island, *Bangham* 523! (F), *Wetmore & Woodworth* 851! (F). DARIEN: vicinity of Campamento Buena Vista, Río Chucunaque above confluence with Río Tuquesa, *Stern, Chambers, Dwyer & Ebinger* 942! (MO, US). PANAMA: San José Island, *Johnston* 1220! (MO, US).

8. ELACHYPTERA A. C. Smith

ELACHYPTERA A. C. Smith, *Brittonia* **3**: 383. 1940.

Lianas or slender trees with scandent branches, glabrous throughout or nearly so, the branches terete. *Leaves* opposite or subopposite, petiolate, stipulate. *Inflorescences* axillary or terminal, many-flowered, paniculate-corymbose, copiously branched, the peduncle and branchlets quadrangular. *Flowers* hermaphrodite, very small, pedicellate; sepals 5, usually broader than long, rounded at the apex; petals 5, imbricate, suberect, entire to erosulous at the margins, thin-carnose; disc continuous, erect, inconspicuous, short-cylindric, often thickened at the margin, carnose or thin-carnose; stamens 3, suberect, the filaments ligulate, the anthers extrorsely nutant, transversely ellipsoid, dehiscing by apical, transversal clefts; pollen grains simple; ovary 3-lobed, 3-celled, each cell 2- or 4- ovulate, the ovules collateral or in superposed pairs, ascending from the inner basal angle; style short, the stigma capitate or 3-lobed, the lobes inconspicuous and opposite the stamens. *Fruits* of 3 capsular mericarps (2 mericarps often abortive), these divergent, separately attached to a slightly swollen receptacle, short-stipitate, nearly flattened or slightly convex on both surfaces, dehiscing along an inconspicuous median suture, the pericarp papyraceous or thin-coriaceous; seeds 1-4 per mericarp, affixed by a very short basal

wing, the wing papyraceous or thin-coriaceous, extended distally into a flange (sometimes greatly expanded) along the inner margin of the embryoniferous portion; cotyledons united.

A genus of tropical America and tropical Africa, consisting of five species; three species are recognized in tropical America, one of which occurs in Panama.

1. *ELACHYPTERA FLORIBUNDA* (Benth.) A. C. Smith, *Brittonia* **3**: 387, fig. 3(a-n). 1940; Johnston, *Sargentia* **8**: 188. 1949.

Hippocratea floribunda Benth., *Bot. Voy. Sulph.* 78. 1844.

Hippocratea celastroides sensu Woodson & Schery, *Ann. Missouri Bot. Gard.* **29**: 357. 1942, non H. B. K. (1822).

Liana or slender tree with scandent branches. *Leaves* with the petiole 3-9 mm. long, the blade ovate-elliptic or elliptic, acute to rounded at the base, gradually short-acuminate or cuspidate at the apex, entire or crenulate-undulate at the margins, 5-12 cm. long and 2-5 cm. broad, chartaceous, the costa prominent on both surfaces. *Inflorescences* solitary or aggregated in clusters of 2-4, 2-11 cm. long. *Flowers* 2-2.7 mm. in diam., often minutely cinereous-puberulus on all exterior surfaces; sepals deltoid to semiorbicular, subentire or erosulous at the margins, 0.3-0.5 mm. long and 0.4-0.7 mm. broad, submembranous or papyraceous; petals oblong to elliptic, entire or distally erosulous, 1-1.7 mm. long and 0.6-1 mm. broad; disc undulate and slightly thickened at the margin, 0.12-0.2 mm. high; filaments of the stamens 0.3-0.4 mm. long, slightly broadened at base and apex, the anthers about 0.2 mm. long and 0.4 mm. broad; ovary 0.4-0.5 mm. in diam., the ovules 2 per cell, collateral; style 0.1-0.3 mm. long, the stigmas forming a minute, capitate shield, obtuse or faintly emarginate, often obscure. *Fruits* often 5-10 per inflorescence, the mericarps elliptic or slightly obovate, obtuse or rounded or faintly emarginate at the apex, 3-4.5 cm. long, 2-2.5 cm. broad and about 3 mm. thick, the pericarp thin-coriaceous, conspicuously flabellate-costate without, smooth within; seeds 2 per mericarp, the embryoniferous portion ellipsoid, the wing oblong, 4-5 mm. long and 2-3 mm. broad distally, gradually narrowed toward the base, extended distally into a narrow, thickened flange.

Guatemala to Panama and northern South America to Brazil.

BOCAS DEL TORO: vicinity of Chiriquí Lagoon, Old Bank Island, *von Wedel* 2038! (MO, US). CANAL ZONE: south of Fort Sherman, *Johnston* 1763! (MO). CHIRIQUÍ: Palo Alto, just east of Boquete, alt. 5,000 ft., partly disturbed forest of cloud-forest type, *Stern, Chambers, Dwyer & Ebinger* 1011! (MO, US). COLÓN: Río Indio de Fató, near sea level, *Pittier* 4274! (US). PANAMA: San José Island, *Erlanson* 393! (US), 523! (US), 562! (US), *Johnston* 484! (MO, US), 1128 1159. VERAGUAS: Isla de Coiba (Penal Colony), *Dwyer* 2402! (MO).

9. CUERVEA (Benth. & Hook. f.) Triana ex Miers

CUERVEA (Benth. & Hook. f.) Triana ex Miers, *Trans. Linn. Soc. London* **28**: 370. 1872.

Lianas or shrubs or slender trees with eventually scandent branches, glabrous throughout, the branches terete. *Leaves* opposite or subopposite, petiolate, stipulate.

Inflorescences axillary or aggregated at the apex of branchlets or arranged on short, leafless branchlets, paniculate-corymbose, the flowers loosely arranged and comparatively few per inflorescence, the peduncle and branchlets terete. *Flowers* hermaphrodite, rather large for the family, pedicellate; sepals 5, broader than long, rounded at the apex, membranous; petals 5, imbricate, spreading or suberect, membranous; disc continuous, erect or suberect, short-cylindric, entire or minutely crenulate at the margin, membranous to thin-coriaceous; stamens 3, suberect, the filaments ligulate, conspicuously broadened toward the base, the anthers extrorsely nutant, transversely ellipsoid, dehiscing by apical, transversal, confluent clefts; pollen grains simple; ovary depressed-3-lobed, 3-celled, each cell 4- or 6-ovulate, the ovules 2-seriate, ascending from the inner basal angle; style carnose, the stigmas 3, sometimes conspicuous. *Fruits* of 3 capsular mericarps, these divergent, separately attached to a swollen receptacle, depressed obovoid or suborbicular, abruptly stipitate, rounded or faintly emarginate at the apex, conspicuously convex on both surfaces, dehiscing along an inconspicuous median suture and bivalved, the pericarp thin-coriaceous or papyraceous, flabellate-costate without, smooth or minutely rugulose within; seeds 2-6 per mericarp, thick, obovoid or ellipsoid, affixed by a basal wing, the wing oblong, gradually narrowed toward the base and distally extended into a narrow flange along the inner margin of the embryoniferous portion; cotyledons massive and united.

A genus of four species, three in tropical America and one in tropical Africa; one species occurs in Panama.

1. *CUERVEA* *KAPPLERIANA* (Miq.) A. C. Smith, *Brittonia* **3**: 399. 1940.—Fig. 1(E, F).

Hippocratea Kappleriana Miq., *Linnaea* **26**: 220. 1853.

Cuervea latifolia Miers, *Trans. Linn. Soc. London* **28**: 372. 1872.

Hippocratea integrifolia sensu Seem., *Bot. Voy. Herald* 90. 1853, non A. Rich. (1843); Hemsl., *Biol. Centr.-Am.* **1**: 193. 1880.

Liana, the branchlets usually opposite, often rugose, cinereous or brownish. *Leaves* with the petiole 8-15 mm. long, the blade elliptic-oblong or ovate-oblong, subattenuate and decurrent at the base, gradually acuminate at the apex, entire or obscurely crenulate at the margins, 8-19 cm. long and 4-10 cm. broad, chartaceous, the costa prominent on both surfaces. *Inflorescences* 5-12 cm. long. *Flowers* 10-17 mm. in diam.; sepals broadly ovate or ovate-deltoid, subentire or faintly erosulous at the margins, 1.3-2.5 mm. long, usually obviously flabellate-nerved; petals often strongly concave, obovate-elliptic, rounded at the apex, entire or faintly undulate-crenulate and often inflexed at the margins, 5.5-9 mm. long and 3.5-7.5 mm. broad; disc 0.4-0.7 mm. high, membranous; stamens 1.6-2.2 mm. long; ovary 0.8-1.5 mm. in diam., the ovules 4-6 per cell, the style stout, the stigmas conspicuous, spreading, oblong, obtuse. *Mericarps* depressed-obovate to suborbicular, 5-9 cm. long, 5.5-10 cm. broad and 1-1.5 cm. thick, the pericarp thin-coriaceous; seeds 4-6 per mericarp, the embryoniferous portion 2-5 cm. long and 1.5-3 cm. broad, the wing about 20-25 mm. long and 5-10 mm. broad distally, coriaceous.

Costa Rica, Panama, northern South America and the West Indies.

BOCAS DEL TORO: region of Almirante, Cooper 474! (F). DARIEN: vicinity of Campamento Buena Vista, Río Chucunaque above confluence with Río Tuquesa near Quebrada Felix, Stern, Chambers, Dwyer & Ebinger 965! (MO, US). VERAGUAS: Isla de Coiba, mouth of Río Juncal, Dwyer 1651! (MO, US), Seemann 643 (K, type of *C. latifolia*).

10. PRIONOSTEMMA Miers

PRIONOSTEMMA Miers, Trans. Linn. Soc. London **28**: 354. 1872.

Lianas, the branches and branchlets opposite or alternate, subterete, sparsely lenticellate. *Leaves* opposite, petiolate, the blade scabrous. *Inflorescences* axillary toward the apex of branchlets, pedunculate, paniculate or pseudocymose; fruiting inflorescences greatly enlarged. *Flowers* hermaphrodite, loosely arranged toward the apex of ultimate branchlets, comparatively large for the family, pedicellate; sepals 5, essentially deltoid, often accrescent; petals 5, unguiculate; disc annular-pulvinate, conspicuously flattened, carnose, puberulus except near the entire margin; stamens 3, inserted at the junction of the disc and the ovary, usually spreading, the filaments ligulate, slightly broadened at the base, the anthers transversely ellipsoid, the thecae subglobose and laterally confluent, dehiscing by apical, transversal, confluent clefts; ovary immersed in the disc, depressed and sharply trigonous, conspicuously puberulus, 3-celled, each cell 8- to 10-ovulate, the ovules 2-seriate; style subulate, obtuse, carnose, the stigmas obscure. *Fruits* few per inflorescence, of 3 capsular mericarps, these divergent, separately attached to a swollen receptacle, obovate or obdeltoid, slightly convex on both surfaces, rounded at margins, bluntly carinate and dehiscing along a median suture, the pericarp coriaceous; seeds 8-10 per mericarp, affixed by a well-developed, membranous, basal wing.

A neotropical, monotypic genus.

1. PRIONOSTEMMA ASPERA (Lam.) Miers, Trans. Linn. Soc. London **28**: 355. 1872;
A. C. Smith, Brittonia **3**: 393, fig. 4. 1940.

Hippocratea aspera Lam., Tab. Encycl. Méth. **1**: 101. 1791.

Hippocratea malpighiaefolia Rudge, Pl. Gui. 10. 1805; Standley, Contr. Arnold Arb. **5**: 93. 1933, pro parte quoad Woodworth & Vestal 580.

Liana with stout branches and slender branchlets, often setulose when young, at length glabrous, usually obscurely scabrous. *Leaves* with the petiole subterete, flattened above, 4-10 mm. long, usually glabrous, scabrous; blade ovate-oblong or elliptic-oblong, rounded or subcordate at the base, bluntly short-acuminate or cuspidate at the apex, entire and often narrowly revolute at the margins, about 7-14 cm. long and 4-7 cm. broad, chartaceous or thin-coriaceous, minutely papillose and scabrous on both surfaces, the costa sharply elevated above, prominent beneath. *Inflorescences* 4-10 cm. long. *Flowers* 9-12 mm. in diam., the pedicel slender, 3-7 mm. long; sepals subacute to rounded at the apex, irregularly erosulous at the margins, 1.7-3 mm. long and broad, thin-coriaceous or carnose, minutely and closely puberulus; petals broadly spatulate, unguiculate, rounded at the apex, deeply and irregularly pectinate-erose at the margins, 4-5 mm. long and broad, membranous, minutely and closely puberulus; disc about 0.5 mm. thick; filaments of the stamens

2.5-3 mm. long, the anthers 0.5-0.6 mm. long and 0.8-1.3 mm. broad; ovary about 1.5 mm. in diam., the style 1.3-2 mm. long. *Mericarps* obtuse and swollen at the base, rounded, truncate, obtuse or slightly emarginate at the apex, 5.5-8 cm. long and 4-6 cm. broad, the pericarp asperate and conspicuously flabellate-costate without, smooth within; seeds with the embryoniferous portion ovoid, up to 14 mm. long and 8 mm. broad, the wing elliptic or obovate, slightly falcate, up to 6 cm. long and 3 cm. broad.

Panama and northern South America, also in subandean Bolivia; Trinidad.

CANAL ZONE: Barro Colorado Island, *Woodworth & Vestal* 580! (F).

11. PRISTIMERA Miers

PRISTIMERA Miers, Trans. Linn. Soc. London **28**: 360. 1872.

Lianas or slender shrubs or trees with scandent branches, glabrous throughout, the branches and branchlets usually opposite, sometimes alternate, slender, lenticellate. *Leaves* opposite, petiolate, the petiole canaliculate. *Inflorescences* axillary or arising from branchlets below the leaves, solitary or aggregated, usually many-flowered, pedunculate, paniculate-corymbose or pseudocymose. *Flowers* hermaphrodite, in distal dichotomies or congested in clusters of 2-5 at the apex of ultimate branchlets, small, pedicellate; sepals 5, rounded or obtuse at the apex; petals 5, spreading or suberect, rounded at the apex, submembranous or thin-carnose; disc minute, forming an annular cushion below the stamens, slightly projecting, often hardly distinguishable from the ovary, carnose; stamens 3, suberect to spreading, the filaments membranous, the anthers extrorsely nutant, transversely ellipsoid, dehiscing by apical, transversal, confluent clefts; ovary depressed-3-lobed, 3-celled, the cells 2- to 8-ovulate, the ovules collateral or in superposed pairs, ascending from the inner basal angle; style very short, obtuse or minutely capitate, the stigmas obscure or minute and alternate with the stamens. *Fruits* several per inflorescence, of 3 capsular mericarps, these divergent, separately attached to a swollen receptacle, flattened on both surfaces, obtuse or subacute and slightly swollen at the base, sharp and entire at the margins, dehiscing along an inconspicuous, median suture, the pericarp papyraceous or thin-coriaceous; seeds 2-8 per mericarp, the embryoniferous portion somewhat flattened, affixed by a conspicuous, membranous, basal wing.

A neotropical genus of nine species, one of which occurs in Panama.

1. PRISTIMERA NERVOSA (Miers) A. C. Smith, Brittonia **3**: 370. 1940.

Sicyomorpha nervosa Miers, Trans. Linn. Soc. London **28**: 412. 1872.

Liana or small tree, the branchlets elongate, subterete or distally subquad-rangular. *Leaves* with the petiole 8-15 mm. long, the blade elliptic or broadly ovate-elliptic, obtuse or acute and decurrent at the base, obtusely acuminate at the apex, undulate or crenate at the margins, 7-20 cm. long and 3-9 cm. broad, papyraceous or chartaceous, the costa strongly elevated above, prominent beneath.

Inflorescences 2.5-7 cm. long, the distal nodes contracted at the base and appearing articulate, the bracts and bractlets conspicuous. *Flowers* 1.7-3.5 mm. in diam., the pedicel slender, less than 1 mm. long; sepals ovate-deltoid or suborbicular, erosulous or conspicuously dentate at the margins, 0.5-0.7 mm. long and 0.7-1.3 mm. broad, submembranous or papyraceous; petals suberect, elliptic-oblong, entire, 1.2-1.8 mm. long and 1-1.3 mm. broad, thin-carnose; disc pentagonous, about 0.1-0.3 mm. thick; stamens suberect, the filaments deltoid-liguliform, conspicuously broadened toward the base, 0.3-0.5 mm. long, the anthers about 0.2 mm. long and 0.3 mm. broad; ovary with 4-8 ovules per cell, the style about 0.1-0.2 mm. long, carnose. *Fruit* unknown.

Panama, Surinam, Venezuela, Peru, Bolivia and Brazil (Acre).

CANAL ZONE: along the Trinidad River, near sea level, *Pittier* 4030! (US).

12. HIPPOCRATEA L.

HIPPOCRATEA L., Sp. Pl. 1191. 1753, Gen. Pl. ed. 5, 498. 1754.

Lianas, the branches and branchlets usually opposite; milky latex present. *Leaves* opposite, petiolate, stipulate. *Inflorescences* axillary, usually many-flowered, cymose-paniculate, with supplementary branchlets in the dichotomies or in the axils of branchlets, pedunculate, the branchlets elongate. *Flowers* hermaphrodite, small or medium-sized, pedicellate, bracteolate; sepals 5, subequal; petals 5, subimbricate or valvate, transversely barbellate within; disc continuous, annular-pulvinate, conspicuous, cupuliform, carnose, minutely tomentellous-papillate without; stamens 3, suberect or spreading and reflexed, the filaments often connate to the upper portion of the disc, the anthers often slightly extrorsely nutant, transversely ellipsoid, dehiscing by apical, transversal, confluent clefts; pollen grains in tetrads; ovary completely immersed in the disc, deeply sulcate, 3-celled, the cells 6- to 8-ovulate, the ovules 2-seriate, ascending from the inner basal angle; style subulate, truncate, the stigmas inconspicuous. *Fruits* 1-3 per inflorescence, of 3 capsular mericarps, these divergent, suberect, separately attached to a swollen receptacle, flattened dorsoventrally, dehiscing along an inconspicuous, median suture, the pericarp papyraceous or thin-coriaceous; seeds 5 or 6 per mericarp, affixed by a conspicuous, basal wing.

A genus of three species, one in tropical America and two in tropical Africa.

1. HIPPOCRATEA VOLUBILIS L., Sp. Pl. 1191. 1753; Standley, Contr. Arnold Arb. **5**: 94. 1933; A. C. Smith, Brittonia **3**: 359, fig. 1. 1940; Johnston, Sargentia **8**: 188. 1949.—Fig. 1(G, H).

Hippocratea obcordata Lam., Tab. Encycl. Méth. **1**: 100, tab. 28 (1). 1791; Hemsl., Biol. Centr.-Am. **1**: 193. 1880.

Hippocratea ovata Lam., loc. cit. 100, tab. 28(2). 1791; Hemsl., loc. cit. 193. 1880; Woodson & Schery, Ann. Missouri Bot. Gard. **29**: 357. 1942.

Hippocratea discolor G. F. W. Meyer, Primit. Fl. Essequiboensis 19. 1818; Seem., Bot. Voy. Herald 90. 1853.

Hippocratea serrulata Miers, Trans. Linn. Soc. London **28**: 344. 1872; Hemsl., loc. cit. 194. 1880.

Hippocratea versicolor Miers, loc. cit. 350. 1872; Hemsl., loc. cit. 194. 1880.

Liana up to 25 m. long, the young parts densely and minutely brown-tomentellous-papillate, the branches often stout, terete, subterete or distally quadrangular, inconspicuously lenticellate. *Leaves* with the petiole slender, canaliculate or narrowly winged distally, 4-10 mm. long; blade ovate to elliptic or oblong-elliptic, rounded or acute at the base, rounded or obtusely cuspidate or short-acuminate at the apex, subentire, crenate or serrate at the margins, 4-17 cm. long and 2-8 cm. wide, chartaceous or rarely thin-coriaceous, the costa slightly or sharply elevated above, prominent beneath. *Inflorescences* 3-15 cm. long, the axes densely and minutely brown-tomentellous-papillate. *Flowers* 4-8 mm. in diam., the pedicel slender, 1-3 mm. long, tomentellous-papillate, the bracteoles about 0.5 mm. long and caducous; sepals broadly ovate to deltoid, rounded, obtuse or obscurely apiculate at the apex, erose or irregularly ciliolate at the margins, 0.5-1.2 mm. long and 0.6-1.4 mm. broad, papyraceous, minutely tomentellous-papillate; petals oblong or elliptic-oblong, subacute at the apex, minutely ciliolate at the margins, 2.5-4 mm. long and 1.3-2.6 mm. broad, minutely tomentellous-papillate especially outside, transversely barbellate inside about 1 mm. below the apex; disc 0.8-1.7 mm. high, often subpentagonous and sometimes expanded at the base; filaments ligulate, broadly expanded and often contiguous at the base, membranous or submembranous, sometimes minutely puberulus; anthers about 0.3-0.5 mm. long and 0.5-0.7 mm. broad; ovary about 1 mm. in diam., the style 0.8-1.3 mm. long. *Mericarps* obovate-elliptic or narrowly elliptic, obtuse and slightly swollen at the base, rounded or emarginate at the apex, subacute and entire at the margins, 4-8 cm. long, 1.5-5 cm. broad and 2-4 mm. thick before dehiscence, the pericarp usually densely and finely flabellate-costate without, smooth within; seeds with the embryoniferous portion obliquely ellipsoid, 13-25 mm. long and 4-7 mm. broad, the wing obovate-oblong, slightly falcate, 2-4 cm. long and 1-1.5 cm. wide.

Southern Florida and central Mexico southward to northern Argentina.

BOCAS DEL TORO: vicinity of Chiriquí Lagoon, *von Wedel* 1059! (MO, US); id., Water Valley, *von Wedel* 1685! (MO, US), 1839! (MO, US). CANAL ZONE: Chagres, Isthmus of Panama, *Fendler* 53! (MO, US, syntype of *H. serrulata*); Barro Colorado Island, *Aviles* 992! (F), *Killip* 40031! (US), *Shattuck* 992! (MO), 1041! (F), 1109! (F), *Wetmore & Abbe* 87! (F), 160! (F), *Woodworth & Vestal* 483! (F), 583! (F); drowned forest of Río Puente near junction with Río Chagres, alt. 66 m., *Dodge, Steyermark & Allen* 16825! (MO); around Culebra, alt. 200-300 m., *Pittier* 3333! (F, US). COLÓN: along Río Fató, in forests or thickets, alt. 10-100 m., *Pittier* 3384! (F, US). DARIEN: Patiño, on cliffs along the beach, *Pittier* 5704! (US); along Río Tuira below El Real and Piriaque Island, *Stern, Chambers, Dwyer, Ebinger* 893! (MO, US); Bay of Ardita, *Seemann* 1102 (K, type of *H. versicolor*). PANAMA: Río Pita, 1-3 miles above confluence with Río Maestra, *Duke* 4739! (MO); San José Island, *Johnston* 529, 605! (MO, US), 739! (MO, US), 1143. PROVINCE UNKNOWN: *Duchassaing s. n.*, *Hayes* 595.

INDEX OF LATIN NAMES

New taxa are in **boldface** type, all other taxa are in roman type; numbers in **boldface** type refer to descriptions, numbers in roman type refer to synonyms, numbers with dagger (†) refer to names incidentally mentioned.

- | | |
|--------------------------|--------------------------------|
| Anthodon, 88 | versicolor, 96 |
| panamense, 88 | volubilis, 96 |
| Celastraceae, 81† | Hippocrateaceae, 81† |
| Cheiloclinium, 82 | Hylenaea, 90 |
| cognatum, 84 | praecelsa, 90 |
| Cuervea, 92 | Kippistia, 84 |
| Kappleriana, 93 | cognata, 84 |
| latifolia, 93 | Peritassa, 86 |
| Elachyptera, 91 | pruinosa, 86 |
| floribunda, 92 | Prionostemma, 94 |
| Hemiangium, 89 | aspera, 94 |
| excelsum, 89 | Pristimera, 95 |
| Hippocratea, 96 | nervosa, 95 |
| aspera, 94 | Salacia, 87 |
| celastroides, 92 | megistophylla, 87 , 88† |
| discolor, 96 | praecelsa, 90 |
| excelsa, 89 | pruinosa, 86 |
| floribunda, 92 | Richardi, 85 |
| integrifolia, 93 | Sicyomorpha, 95 |
| Kappleriana, 93 | nervosa, 95 |
| malpighiaefolia, 88, 94 | pruinosa, 86 |
| obcordata, 96 | Tontelea, 84 |
| ovata, 96 | Richardii, 85 |
| serrulata, 96 | Tyloderma, 90 |
| sp., 86 | praecelsa, 90 |